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SEQUENCE LISTING

<110> Ponath, Paul D.  
Ringler, Douglas J.  
Jones, S. Tarran  
Newman, Walter  
Saldanha, Jose  
Bendig, Mary M.

<120> Humanized Immunoglobulin Reactive with  
alpha4beta7 Integrin

<130> 1855.1017-000

<140> 08/700,737

<141> 1996-08-15

<160> 67

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 494

<212> DNA

<213> Artificial Sequence

<220>

<223> Mouse consensus sequence

<221> unsure

<222> (450)...(450)

<223> n=A,T,G or C

<221> unsure

<222> (466)...(466)

<223> n=A,T,G or C

<221> unsure

<222> (467)...(467)

<223> n=A,T,G or C

<221> unsure

<222> (482)...(482)

<223> n=A,T,G or C

<221> unsure

<222> (483)...(483)

<223> n=A,T,G or C

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gtccactccc	aggtccaact	gcagcagcct	ggggctgagc	ttgtgaagcc	tgggacttca	120
gtgaagctgt	cctgcaaggg	ttatggctac	accttcacca	gctactggat	gcactgggtg	180
aagcagaggc	ctggacaagg	ccttgagtgg	atcggagaga	ttgatacttc	tgagagtaat	240
actaactaca	atcaaaaatt	caagggaag	gccacattga	ctgtagacat	ttcctccagc	300
acagcctaca	tgcagctcag	cagcctgaca	tctgaggact	ctgcggtcta	ctattgtgca	360
agagggggtt	acgacggatg	ggactatgct	attgactact	ggggtcaagg	cacctcagtc	420
accgtctcct	cagccaaaac	gacaccrycn	csyktmtmyc	yysbdnnccc	ykggrwscytg	480

gnngaagctt ggga

<210> 2  
 <211> 144  
 <212> PRT  
 <213> Artificial Sequence  
  
 <220>  
 <223> Mouse consensus sequence  
  
 <221> UNSURE  
 <222> (2)...(6)  
 <223> Xaa = Any Amino Acid  
  
 <221> UNSURE  
 <222> (8)...(8)  
 <223> Xaa = Any Amino Acid

<400> 2  
 Met Xaa Xaa Xaa Xaa Xaa Ile Xaa Phe Leu Val Ser Thr Ala Thr Ser  
   1                  5                  10                  15  
 Val His Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys  
                   20                  25                  30  
 Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe  
           35                  40                  45  
 Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu  
   50                  55                  60  
 Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn  
 65                  70                  75                  80  
 Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser  
                   85                  90                  95  
 Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val  
           100                  105                  110  
 Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp  
           115                  120                  125  
 Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser Ala Lys Thr Thr  
   130                  135                  140

<210> 3  
 <211> 428  
 <212> DNA  
 <213> Unknown

<220>  
 <223> Mouse

<221> CDS  
 <222> (18)...(428)

<400> 3  
 ttacttgacg actcggg atg gga tgg agc tat atc atc ttc ttc ttg gta   50  
                   Met Gly Trp Ser Tyr Ile Ile Phe Phe Leu Val  
                   1                  5                  10  
  
 tca aca gct aca agt gtc cac tcc cag gtc caa ctg cag cag cct ggg   98  
 Ser Thr Ala Thr Ser Val His Ser Gln Val Gln Leu Gln Gln Pro Gly  
                   15                  20                  25

gct gag ctt gtg aag cct ggg act tca gtg aag ctg tcc tgc aag ggt 146  
 Ala Glu Leu Val Lys Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly  
           30                          35                          40

tat ggc tac acc ttc acc agc tac tgg atg cac tgg gtg aag cag agg 194  
 Tyr Gly Tyr Thr Phe Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg  
           45                          50                          55

cct gga caa ggc ctt gag tgg atc gga gag att gat cct tct gag agt 242  
 Pro Gly Gln Gly Leu Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser  
           60                          65                          70                          75

aat act aac tac aat caa aaa ttc aag ggc aag gcc aca ttg act gta 290  
 Asn Thr Asn Tyr Asn Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val  
                           80                          85                          90

gac att tcc tcc agc aca gcc tac atg cag ctc agc agc ctg aca tct 338  
 Asp Ile Ser Ser Ser Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser  
                           95                          100                          105

gag gac tct gcg gtc tac tat tgt gca aga ggg ggt tac gac gga tgg 386  
 Glu Asp Ser Ala Val Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp  
           110                          115                          120

gac tat gct att gac tac tgg ggt caa ggc aca tca gtc acc 428  
 Asp Tyr Ala Ile Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr  
           125                          130                          135

<210> 4  
 <211> 137  
 <212> PRT  
 <213> Unknown

<220>  
 <223> Mouse

<400> 4  
 Met Gly Trp Ser Tyr Ile Ile Phe Phe Leu Val Ser Thr Ala Thr Ser  
   1                          5                          10                          15  
 Val His Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys  
           20                          25                          30  
 Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe  
           35                          40                          45  
 Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu  
           50                          55                          60  
 Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn  
   65                          70                          75                          80  
 Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser  
           85                          90                          95  
 Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val  
           100                          105                          110  
 Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp  
           115                          120                          125  
 Tyr Trp Gly Gln Gly Thr Ser Val Thr  
           130                          135

<210> 5  
 <211> 535  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Mouse consensus sequence

<221> CDS  
 <222> (16)...(435)

<400> 5  
 cgattactag tcgac atg aag ttg cct gtt agg ctg ttg gtg ctt ctg ttg 51  
                   Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu  
                   1                  5                  10

ttc tgg att cct gtt tcc gga ggt gat gtt gtg gtg act caa act cca 99  
 Phe Trp Ile Pro Val Ser Gly Gly Asp Val Val Val Thr Gln Thr Pro  
           15                  20                  25

ctc tcc ctg cct gtc agc ttt gga gat caa gtt tct atc tct tgc agg 147  
 Leu Ser Leu Pro Val Ser Phe Gly Asp Gln Val Ser Ile Ser Cys Arg  
           30                  35                  40

tct agt cag agt ctt gca aag agt tat ggg aac acc tat ttg tct tgg 195  
 Ser Ser Gln Ser Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp  
           45                  50                  55                  60

tac ctg cac aag cct ggc cag tct cca cag ctc ctc atc tat ggg att 243  
 Tyr Leu His Lys Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile  
                   65                  70                  75

tcc aac aga ttt tct ggg gtg cca gac agg ttc agt ggc agt ggt tca 291  
 Ser Asn Arg Phe Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser  
                   80                  85                  90

ggg aca gat ttc aca ctc aag atc agc aca ata aag cct gag gac ttg 339  
 Gly Thr Asp Phe Thr Leu Lys Ile Ser Thr Ile Lys Pro Glu Asp Leu  
           95                  100                  105

gga atg tat tac tgc tta caa ggt aca cat cag ccg tac acg ttc gga 387  
 Gly Met Tyr Tyr Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly  
           110                  115                  120

ggg ggg acc aag ctg gaa ata aaa cgg gct gat gct gca cca act gta 435  
 Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala Asp Ala Ala Pro Thr Val  
           125                  130                  135                  140

tccatcttcc caccatccag taagcttggg aatccatatg actagtagat cctctagagt 495  
 cgacctgcag gcatgcaagc ttccctatatg tgagtcgtat 535

<210> 6  
 <211> 140  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Mouse consensus sequence

&lt;400&gt; 6

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Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu Phe Trp Ile Pro
 1           5           10           15
Val Ser Gly Gly Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu Pro
           20           25           30
Val Ser Phe Gly Asp Gln Val Ser Ile Ser Cys Arg Ser Ser Gln Ser
           35           40           45
Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu His Lys
           50           55           60
Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe
65           70           75           80
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
           85           90           95
Thr Leu Lys Ile Ser Thr Ile Lys Pro Glu Asp Leu Gly Met Tyr Tyr
           100          105          110
Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly Gly Gly Thr Lys
           115          120          125
Leu Glu Ile Lys Arg Ala Asp Ala Ala Pro Thr Val
           130          135          140

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&lt;210&gt; 7

&lt;211&gt; 112

&lt;212&gt; PRT

&lt;213&gt; Unknown

&lt;220&gt;

&lt;223&gt; Mouse

&lt;400&gt; 7

```

Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Phe Gly
 1           5           10           15
Asp Gln Val Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Ala Lys Ser
           20           25           30
Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu His Lys Pro Gly Gln Ser
           35           40           45
Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe Ser Gly Val Pro
           50           55           60
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65           70           75           80
Ser Thr Ile Lys Pro Glu Asp Leu Gly Met Tyr Tyr Cys Leu Gln Gly
           85           90           95
Thr His Gln Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
           100          105          110

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&lt;210&gt; 8

&lt;211&gt; 112

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 8

```

Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly
 1           5           10           15
Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser
           20           25           30
Asn Gly Tyr Asn Tyr Leu Asp Trp Tyr Leu Gln Lys Pro Gly Gln Ser
           35           40           45

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Pro Gln Leu Leu Ile Tyr Leu Gly Ser Asn Arg Ala Ser Gly Val Pro  
50 55 60  
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile  
65 70 75 80  
Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Met Gln Ala  
85 90 95  
Leu Gln Thr Pro Gln Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys  
100 105 110

<210> 9  
<211> 121  
<212> PRT  
<213> Unknown

<220>  
<223> Mouse

<400> 9  
Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Thr  
1 5 10 15  
Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe Thr Ser Tyr  
20 25 30  
Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile  
35 40 45  
Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn Gln Lys Phe  
50 55 60  
Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser Thr Ala Tyr  
65 70 75 80  
Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys  
85 90 95  
Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp Tyr Trp Gly  
100 105 110  
Gln Gly Thr Ser Val Thr Val Ser Ser  
115 120

<210> 10  
<211> 119  
<212> PRT  
<213> Homo sapiens

<400> 10  
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
1 5 10 15  
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr  
20 25 30  
Ala Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu Glu Trp Met  
35 40 45  
Gly Trp Ile Asn Ala Gly Asn Gly Asn Thr Lys Tyr Ser Gln Lys Phe  
50 55 60  
Gln Gly Arg Val Thr Ile Thr Arg Asp Thr Ser Ala Ser Thr Ala Tyr  
65 70 75 80  
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95  
Ala Arg Gly Gly Tyr Tyr Gly Ser Gly Ser Asn Tyr Trp Gly Gln Gly  
100 105 110  
Thr Leu Val Thr Val Ser Ser  
115

<210> 11  
 <211> 396  
 <212> DNA  
 <213> Unknown

<220>  
 <223> Mouse

<221> CDS  
 <222> (1)...(396)

<400> 11  
 atg aag ttg cct gtt agg ctg ttg gtg ctt ctg ttg ttc tgg att cct 48  
 Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu Phe Trp Ile Pro  
 1 5 10 15  
 gtt tcc gga ggt gat gtt gtg gtg act caa act cca ctc tcc ctg cct 96  
 Val Ser Gly Gly Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu Pro  
 20 25 30  
 gtc agc ttt gga gat caa gtt tct atc tct tgc agg tct agt cag agt 144  
 Val Ser Phe Gly Asp Gln Val Ser Ile Ser Cys Arg Ser Ser Gln Ser  
 35 40 45  
 ctt gca aag agt tat ggg aac acc tat ttg tct tgg tac ctg cac aag 192  
 Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu His Lys  
 50 55 60  
 cct ggc cag tct cca cag ctc ctc atc tat ggg att tcc aac aga ttt 240  
 Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe  
 65 70 75 80  
 tct ggg gtg cca gac agg ttc agt ggc agt ggt tca ggg aca gat ttc 288  
 Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe  
 85 90 95  
 aca ctc aag atc agc aca ata aag cct gag gac ttg gga atg tat tac 336  
 Thr Leu Lys Ile Ser Thr Ile Lys Pro Glu Asp Leu Gly Met Tyr Tyr  
 100 105 110  
 tgc tta caa ggt aca cat cag ccg tac acg ttc gga ggg ggg acc aag 384  
 Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly Gly Gly Thr Lys  
 115 120 125  
 ctg gaa ata aaa 396  
 Leu Glu Ile Lys  
 130

<210> 12  
 <211> 132  
 <212> PRT  
 <213> Unknown

<220>  
 <223> Mouse

<400> 12

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Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu Phe Trp Ile Pro
 1           5           10           15
Val Ser Gly Gly Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu Pro
          20           25           30
Val Ser Phe Gly Asp Gln Val Ser Ile Ser Cys Arg Ser Ser Gln Ser
          35           40           45
Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu His Lys
          50           55           60
Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe
          65           70           75           80
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
          85           90           95
Thr Leu Lys Ile Ser Thr Ile Lys Pro Glu Asp Leu Gly Met Tyr Tyr
          100          105          110
Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly Gly Gly Thr Lys
          115          120          125
Leu Glu Ile Lys
          130

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<210> 13
<211> 336
<212> DNA
<213> Homo sapiens

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<400> 13
gatattgtga tgactcagtc tccactctcc ctgcccgtca cccctggaga gccggcctcc 60
atctcctgca ggtctagtca gagcctcctc catagtaatg gatcaaaacta tttggattgg 120
tacctgcaga agccagggca gtctccacag ctccctgatct atttgggttc taatcggggc 180
tccgggggtcc ctgacaggtt cagtggcagt ggatcaggca cagattttac actgaaaatc 240
agcagagtgg aggctgagga tggtgggggtt tattactgca tgcaagctct accaactcct 300
cagacgttcg gccaaaggac caaggtggaa atcaaa 336

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<210> 14
<211> 420
<212> DNA
<213> Artificial Sequence

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```

<220>
<223> Mouse Act-1 antibody heavy chain variable region
      with a signal peptide sequence

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<221> CDS
<222> (1)...(420)

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```

<400> 14
atg gga tgg agc tgt atc atc ctc ttc ttg gta tca aca gct aca agt 48
Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ser Thr Ala Thr Ser
 1           5           10           15

gtc cac tcc cag gtc caa ctg cag cag cct ggg gct gag ctt gtg aag 96
Val His Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys
          20           25           30

cct ggg act tca gtg aag ctg tcc tgc aag ggt tat ggc tac acc ttc 144
Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe
          35           40           45

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acc agc tac tgg atg cac tgg gtg aag cag agg cct gga caa ggc ctt 192  
Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu  
50 55 60

gag tgg atc gga gag att gat cct tct gag agt aat act aac tac aat 240  
Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn  
65 70 75 80

caa aaa ttc aag ggc aag gcc aca ttg act gta gac att tcc tcc agc 288  
Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser  
85 90 95

aca gcc tac atg cag ctc agc agc ctg aca tct gag gac tct gcg gtc 336  
Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val  
100 105 110

tac tat tgt gca aga ggg ggt tac gac gga tgg gac tat gct att gac 384  
Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp  
115 120 125

tac tgg ggt caa ggc acc tca gtc acc gtc tcc tca 420  
Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser  
130 135 140

<210> 15

<211> 140

<212> PRT

<213> Artificial Sequence

<220>

<223> Mouse Act-1 antibody heavy chain variable region  
with a signal peptide sequence

<400> 15

Met Gly Trp Ser Cys Ile Ile Leu Phe Leu Val Ser Thr Ala Thr Ser  
1 5 10 15  
Val His Ser Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys  
20 25 30  
Pro Gly Thr Ser Val Lys Leu Ser Cys Lys Gly Tyr Gly Tyr Thr Phe  
35 40 45  
Thr Ser Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu  
50 55 60  
Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn  
65 70 75 80  
Gln Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Ile Ser Ser Ser  
85 90 95  
Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val  
100 105 110  
Tyr Tyr Cys Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp  
115 120 125  
Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser  
130 135 140

<210> 16

<211> 414

<212> DNA

<213> Artificial Sequence

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<220>

<223> Human 21/28'CL antibody heavy chain variable  
region with a signal peptide sequence

<221> CDS

<222> (1)...(414)

<400> 16

atg	gag	ttt	ggg	ctg	agc	tgg	ctt	ttt	ctt	gtg	gct	att	tta	aaa	ggg	48
Met	Glu	Phe	Gly	Leu	Ser	Trp	Leu	Phe	Leu	Val	Ala	Ile	Leu	Lys	Gly	
1				5					10					15		

gtc	cag	tgt	cag	gtg	cag	ctt	gtg	cag	tct	ggg	gct	gag	gtg	aag	aag	96
Val	Gln	Cys	Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	
			20					25					30			

cct	ggg	gcc	tca	gtg	aag	ggt	tcc	tgc	aag	gct	tct	gga	tac	acc	ttc	144
Pro	Gly	Ala	Ser	Val	Lys	Val	Ser	Cys	Lys	Ala	Ser	Gly	Tyr	Thr	Phe	
		35					40					45				

act	agc	tat	gct	atg	cat	tgg	gtg	cgc	cag	gcc	ccc	gga	caa	agg	ctt	192
Thr	Ser	Tyr	Ala	Met	His	Trp	Val	Arg	Gln	Ala	Pro	Gly	Gln	Arg	Leu	
	50					55					60					

gag	tgg	atg	gga	tgg	atc	aac	gct	ggc	aat	ggt	aac	aca	aaa	tat	tca	240
Glu	Trp	Met	Gly	Trp	Ile	Asn	Ala	Gly	Asn	Gly	Asn	Thr	Lys	Tyr	Ser	
65					70				75						80	

cag	aag	ttc	cag	ggc	aga	gtc	acc	att	acc	agg	gac	aca	tcc	gcg	agc	288
Gln	Lys	Phe	Gln	Gly	Arg	Val	Thr	Ile	Thr	Arg	Asp	Thr	Ser	Ala	Ser	
			85						90					95		

aca	gcc	tac	atg	gag	ctg	agc	agc	ctg	aga	tct	gaa	gac	acg	gct	gtg	336
Thr	Ala	Tyr	Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Val	
			100					105					110			

tat	tac	tgt	gcg	aga	gga	ggt	tac	tat	ggt	tcg	ggg	agc	aac	tac	tgg	384
Tyr	Tyr	Cys	Ala	Arg	Gly	Gly	Tyr	Tyr	Gly	Ser	Gly	Ser	Asn	Tyr	Trp	
		115					120					125				

ggc	cag	gga	acc	ctg	gtc	acc	gtc	tcc	tca							414
Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser							
	130						135									

<210> 17

<211> 138

<212> PRT

<213> Artificial Sequence

<220>

<223> Human 21/28'CL antibody heavy chain variable  
region with a signal peptide sequence

<400> 17

Met	Glu	Phe	Gly	Leu	Ser	Trp	Leu	Phe	Leu	Val	Ala	Ile	Leu	Lys	Gly	
1				5					10					15		
Val	Gln	Cys	Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	
			20					25					30			

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Pro Gly Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe
   35           40           45
Thr Ser Tyr Ala Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu
   50           55           60
Glu Trp Met Gly Trp Ile Asn Ala Gly Asn Gly Asn Thr Lys Tyr Ser
   65           70           75           80
Gln Lys Phe Gln Gly Arg Val Thr Ile Thr Arg Asp Thr Ser Ala Ser
           85           90           95
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val
           100          105          110
Tyr Tyr Cys Ala Arg Gly Gly Tyr Tyr Gly Ser Gly Ser Asn Tyr Trp
           115          120          125
Gly Gln Gly Thr Leu Val Thr Val Ser Ser
   130           135

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<210> 18  
 <211> 540  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Portion of humanized Act-1 antibody heavy chain  
 with a heavy chain signal peptide sequence

<221> CDS  
 <222> (1)...(540)

```

<400> 18
atg aaa tgc acc tgg gtc att ctc ttc ttg gta tca aca gct aca agt 48
Met Lys Cys Thr Trp Val Ile Leu Phe Leu Val Ser Thr Ala Thr Ser
  1           5           10           15

gtc cac tcc cag gtc caa cta gtg cag tct ggg gct gag gtt aag aag 96
Val His Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
           20           25           30

cct ggg gct tca gtg aag gtg tcc tgc aag ggt tct ggc tac acc ttc 144
Pro Gly Ala Ser Val Lys Val Ser Cys Lys Gly Ser Gly Tyr Thr Phe
           35           40           45

acc agc tac tgg atg cat tgg gtg agg cag gcg cct ggc caa cgt cta 192
Thr Ser Tyr Trp Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu
           50           55           60

gag tgg atc gga gag att gat cct tct gag agt aat act aac tac aat 240
Glu Trp Ile Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn
   65           70           75           80

caa aaa ttc aag gga cgc gtc aca ttg act gta gac att tcc gct agc 288
Gln Lys Phe Lys Gly Arg Val Thr Leu Thr Val Asp Ile Ser Ala Ser
           85           90           95

aca gcc tac atg gag ctc agc agc ctg aga tct gag gac act gcg gtc 336
Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val
           100          105          110

```

12/25

tac	tat	tgt	gca	aga	ggg	ggg	tac	gac	gga	tgg	gac	tat	gct	att	gac	384
Tyr	Tyr	Cys	Ala	Arg	Gly	Gly	Tyr	Asp	Gly	Trp	Asp	Tyr	Ala	Ile	Asp	
		115					120					125				

tac	tgg	ggg	caa	ggc	acc	ctg	gtc	acc	gtc	tcc	tca	gcc	tcc	acc	aag	432
Tyr	Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	
	130					135					140					

ggc	cca	tcg	gtc	ttc	ccc	ctg	gca	ccc	tcc	tcc	aag	agc	acc	tct	ggg	480
Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	
145					150					155					160	

ggc	aca	gcg	gcc	ctg	ggc	tgc	ctg	gtc	aag	gac	tac	ttc	ccc	gaa	ccg	528
Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	
				165					170					175		

gtg	acg	gtg	tcg													540
Val	Thr	Val	Ser													
			180													

<210> 19

<211> 180

<212> PRT

<213> Artificial Sequence

<220>

<223> Portion of humanized Act-1 antibody heavy chain  
with a heavy chain signal peptide sequence

<400> 19

Met	Lys	Cys	Thr	Trp	Val	Ile	Leu	Phe	Leu	Val	Ser	Thr	Ala	Thr	Ser	
1				5					10					15		
Val	His	Ser	Gln	Val	Gln	Leu	Val	Gln	Ser	Gly	Ala	Glu	Val	Lys	Lys	
			20					25					30			
Pro	Gly	Ala	Ser	Val	Lys	Val	Ser	Cys	Lys	Gly	Ser	Gly	Tyr	Thr	Phe	
		35					40					45				
Thr	Ser	Tyr	Trp	Met	His	Trp	Val	Arg	Gln	Ala	Pro	Gly	Gln	Arg	Leu	
	50					55					60					
Glu	Trp	Ile	Gly	Glu	Ile	Asp	Pro	Ser	Glu	Ser	Asn	Thr	Asn	Tyr	Asn	
65					70					75					80	
Gln	Lys	Phe	Lys	Gly	Arg	Val	Thr	Leu	Thr	Val	Asp	Ile	Ser	Ala	Ser	
			85					90					95			
Thr	Ala	Tyr	Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Val	
			100					105					110			
Tyr	Tyr	Cys	Ala	Arg	Gly	Gly	Tyr	Asp	Gly	Trp	Asp	Tyr	Ala	Ile	Asp	
		115					120					125				
Tyr	Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	
	130					135					140					
Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	
145					150					155					160	
Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	
				165					170					175		
Val	Thr	Val	Ser													
			180													

<210> 20

<211> 413

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Portion of humanized Act-1 antibody light chain  
with a light chain signal peptide sequence

&lt;400&gt; 20

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atgaagttgc ctggttaggct gttggtgctt ctgttggttct ggattcctgt ttccggaggt 60
gatgttggtga tgactcaaag tccactctcc ctgcctgtca cccctggaga accagcttct 120
atctcttgca ggtctagtca gagtcttgca aagagttatg ggaacaccta tttgtcttgg 180
tacctgcaga agcctggcca gtctccacag ctctcatct atgggatttc caacagattt 240
tctggggtgc cagacaggtt cagtggcagt ggttcaggga cagatttcac actcaagatc 300
tcgcgagtag aggctgagga cgtgggagtg tattactgct tacaaggtag acatcagccg 360
tacacgttcg gacaggggac caaggtggaa ataaaacggg ctgatgcggc gcc 413

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&lt;210&gt; 21

&lt;211&gt; 138

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Portion of humanized Act-1 antibody light chain  
with a light chain signal peptide sequence

&lt;400&gt; 21

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Met Lys Leu Pro Val Arg Leu Leu Val Leu Leu Leu Phe Trp Ile Pro
 1           5           10           15
Val Ser Gly Gly Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro
          20           25           30
Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser
          35           40           45
Leu Ala Lys Ser Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu Gln Lys
          50           55           60
Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe
65           70           75           80
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
          85           90           95
Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr
          100          105          110
Cys Leu Gln Gly Thr His Gln Pro Tyr Thr Phe Gly Gln Gly Thr Lys
          115          120          125
Val Glu Ile Lys Arg Ala Asp Ala Ala Pro
          130          135

```

&lt;210&gt; 22

&lt;211&gt; 94

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Synthetic oligonucleotide

&lt;400&gt; 22

```

tttccggagg tgatgttgat atgactcaaa gtccactctc cctgcctgtc acccctggag 60
aaccagcttc tatctcttgc aggtctagtc agag 94

```

&lt;210&gt; 23

<211> 94  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 23  
 actggccagg cttctgcagg taccaagaca aataggtggt ccataactc ttgcaagac 60  
 tctgactaga cctgcaagag atagaagctg gttc 94

<210> 24  
 <211> 83  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 24  
 cctggccagt ctccacagct cctcatctat gggatttcca acagattttc tggggtgcc 60  
 gacaggttca gtggcagtgg ttc 83

<210> 25  
 <211> 84  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 25  
 actcgcgaga tcttgagtgt gaaatctgtc cctgaaccac tgccactgaa cctgtctggc 60  
 accccagaaa atctgttgga aatc 84

<210> 26  
 <211> 67  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 26  
 tctcgcgagt agaggctgag gacgtgggag tgtattactg cttacaaggt acacatcagc 60  
 cgtacac 67

<210> 27  
 <211> 86  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 27  
 atggcgccgc atcagcccgt tttatttcca ccttggtccc ctgtccgaac gtgtacggct 60  
 gatgtgtacc ttgtaagcag taatac 86

<210> 28  
 <211> 93  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 28  
 ataagcttcg ccatgaaatg cacctgggtc attctcttct tggatatcaac agctacaagt 60  
 gtccactccc aggtccaact agtgcaccgg tta 93

<210> 29  
 <211> 93  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 29  
 taaccgggtgc actagttgga cctggggagtg gacacttgta gctgttgata ccaagaagag 60  
 aatgaccag gtgcatttca tggcgaagct tat 93

<210> 30  
 <211> 87  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 30  
 caactagtgc agtctggggc tgagggttaag aagcctgggg cttcagtga ggtgtcctgc 60  
 aagggttctg gctacacctt caccagc 87

<210> 31  
 <211> 88  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 31  
 taaccggtac tctagacgtt ggccaggcgc ctgcctcacc caatgcatcc agtagctggt 60  
 gaaggtgtag ccagaaccct tgcaggac 88

<210> 32  
 <211> 76  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 32  
 cgtctagagt ggatcggaga gattgatcct tctgagagta atactaacta caatcaaaaa 60  
 ttcaaggac gcgtca 76

<210> 33  
 <211> 76  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 33  
 taaccggtgt gctagcggaa atgtctacag tcaatgtgac gcgtcccttg aatttttgat 60  
 tgtagttagt attact 76

<210> 34  
 <211> 88  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 34  
 ccgctagcac agcctacatg gagctcagca gcctgagatc tgaggacact gcggtctact 60  
 attgtgcaag aggggggttac gacggatg 88

<210> 35  
 <211> 88  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 35  
 tcaccggtgc ggtgaccagg gtgccttgac cccagtagtc aatagcatag tcccatccgt 60  
 cgtaaccccc tcttgacaaa tagtagac 88

<210> 36  
 <211> 85  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 36  
 ctgggtcaccg tctcctcagc ctccaccaag ggcccatcgg tcttccccct ggcaccctcc 60  
 tccaagagca cctctggggg cacag 85

<210> 37  
 <211> 85  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 37  
 tcaccggttc ggggaagtag tccttgacca ggcagcccag ggccgctgtg cccccagagg 60  
 tgctcttggg ggagggtgcc agggg 85

<210> 38  
<211> 10  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic oligonucleotide

<400> 38  
ctggccaacg 10

<210> 39  
<211> 34  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic oligonucleotide

<400> 39  
cacattgact gtagacactt ccgctagcac agcc 34

<210> 40  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic oligonucleotide

<400> 40  
ccggaggtga tggtgtggtg actc 24

<210> 41  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic oligonucleotide

<400> 41  
taagcttccg ccatgggatg gagc 24

<210> 42  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic oligonucleotide

<400> 42  
ggtgacacta gtgccttgac cccag 25

<210> 43  
<211> 24  
<212> DNA  
<213> Artificial Sequence

&lt;220&gt;

&lt;223&gt; Synthetic oligonucleotide

&lt;400&gt; 43

taagcttccg ccatgaagtt gcct

24

&lt;210&gt; 44

&lt;211&gt; 21

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Synthetic oligonucleotide

&lt;400&gt; 44

ggcgccgcat cagcccgttt t

21

&lt;210&gt; 45

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Synthetic oligonucleotide

&lt;400&gt; 45

cggcgccatc tgtcttcac

20

&lt;210&gt; 46

&lt;211&gt; 18

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Synthetic oligonucleotide

&lt;400&gt; 46

aagcttctaa cactctcc

18

&lt;210&gt; 47

&lt;211&gt; 19

&lt;212&gt; PRT

&lt;213&gt; Unknown

&lt;220&gt;

&lt;223&gt; Mouse

&lt;400&gt; 47

Asp	Val	Val	Val	Thr	Gln	Thr	Pro	Leu	Ser	Leu	Pro	Val	Ser	Phe	Asp
1				5				10					15		

Gly Gln Val

&lt;210&gt; 48

&lt;211&gt; 11

&lt;212&gt; PRT

&lt;213&gt; Unknown

&lt;220&gt;

&lt;223&gt; Mouse

&lt;400&gt; 48

Asp Val Val Val Thr Gln Thr Pro Leu Ser Leu

1

5

10

&lt;210&gt; 49

&lt;211&gt; 8

&lt;212&gt; PRT

&lt;213&gt; Unknown

&lt;220&gt;

&lt;223&gt; Mouse

&lt;400&gt; 49

Asp Tyr Ala Ile Asp Tyr Trp Gly

1

5

&lt;210&gt; 50

&lt;211&gt; 113

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Mouse consensus sequence

&lt;400&gt; 50

Asp Val Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly

1

5

10

15

Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His Ser

20

25

30

Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser

35

40

45

Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro

50

55

60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile

65

70

75

80

Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly

85

90

95

Thr His Val Pro Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile

100

105

110

Lys

&lt;210&gt; 51

&lt;211&gt; 114

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Human consensus sequence

&lt;221&gt; UNSURE

&lt;222&gt; (33)...(33)

&lt;223&gt; Xaa = Any Amino Acid

<221> UNSURE  
 <222> (100)...(100)  
 <223> Xaa = Any Amino Acid

<221> UNSURE  
 <222> (103)...(103)  
 <223> Xaa = Any Amino Acid

<400> 51  
 Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly  
 1 5 10 15  
 Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser  
 20 25 30  
 Xaa Asp Gly Asn Asn Tyr Leu Asn Trp Tyr Leu Gln Lys Pro Gly Gln  
 35 40 45  
 Ser Pro Gln Leu Leu Ile Tyr Leu Val Ser Asn Arg Ala Ser Gly Val  
 50 55 60  
 Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys  
 65 70 75 80  
 Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Met Gln  
 85 90 95  
 Ala Leu Gln Xaa Pro Arg Xaa Thr Phe Gly Gln Gly Thr Lys Val Glu  
 100 105 110  
 Ile Lys

<210> 52  
 <211> 112  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Reshaped humanized sequence

<400> 52  
 Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro Gly  
 1 5 10 15  
 Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Ala Lys Ser  
 20 25 30  
 Tyr Gly Asn Thr Tyr Leu Ser Trp Tyr Leu Gln Lys Pro Gly Gln Ser  
 35 40 45  
 Pro Gln Leu Leu Ile Tyr Gly Ile Ser Asn Arg Phe Ser Gly Val Pro  
 50 55 60  
 Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile  
 65 70 75 80  
 Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Leu Gln Gly  
 85 90 95  
 Thr His Gln Pro Tyr Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys  
 100 105 110

<210> 53  
 <211> 127  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Mouse consensus sequence

<221> UNSURE  
 <222> (106)...(107)  
 <223> Xaa = Any Amino Acid

<221> UNSURE  
 <222> (110)...(110)  
 <223> Xaa = Any Amino Acid

<400> 53  
 Gln Val Gln Leu Gln Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Ala  
 1 5 10 15  
 Ser Val Lys Leu Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr  
 20 25 30  
 Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile  
 35 40 45  
 Gly Arg Ile Asp Pro Asn Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe  
 50 55 60  
 Lys Ser Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Ser Thr Ala Tyr  
 65 70 75 80  
 Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys  
 85 90 95  
 Ala Arg Tyr Tyr Tyr Gly Gly Ser Ser Xaa Xaa Val Tyr Xaa Tyr Trp  
 100 105 110  
 Tyr Phe Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser  
 115 120 125

<210> 54  
 <211> 129  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Human consensus sequence

<221> UNSURE  
 <222> (115)...(115)  
 <223> Xaa = Any Amino Acid

<400> 54  
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15  
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr  
 20 25 30  
 Ala Ile Ser Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45  
 Gly Trp Ile Asn Pro Tyr Gly Asn Gly Asp Thr Asn Tyr Ala Gln Lys  
 50 55 60  
 Phe Gln Gly Arg Val Thr Ile Thr Ala Asp Thr Ser Thr Ser Thr Ala  
 65 70 75 80  
 Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr  
 85 90 95  
 Cys Ala Arg Ala Pro Gly Tyr Gly Ser Gly Gly Gly Cys Tyr Arg Gly  
 100 105 110  
 Asp Tyr Xaa Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser  
 115 120 125  
 Ser

<210> 55  
 <211> 121  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Reshaped humanized sequence

<400> 55  
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
   1                  5                  10                  15  
 Ser Val Lys Val Ser Cys Lys Gly Ser Gly Tyr Thr Phe Thr Ser Tyr  
           20                  25                  30  
 Trp Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu Glu Trp Ile  
           35                  40                  45  
 Gly Glu Ile Asp Pro Ser Glu Ser Asn Thr Asn Tyr Asn Gln Lys Phe  
   50                  55                  60  
 Lys Gly Arg Val Thr Leu Thr Val Asp Ile Ser Ala Ser Thr Ala Tyr  
 65                  70                  75                  80  
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys  
                   85                  90                  95  
 Ala Arg Gly Gly Tyr Asp Gly Trp Asp Tyr Ala Ile Asp Tyr Trp Gly  
           100                  105                  110  
 Gln Gly Thr Leu Val Thr Val Ser Ser  
       115                  120

<210> 56  
 <211> 35  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<221> modified base  
 <222> (30)...(30)  
 <223> n = I

<400> 56  
 cccaagcttc cagggrrccar kggataracn grtgg

35

<210> 57  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic oligonucleotide

<400> 57  
 cccaagctta cgaggggggaa gacatttggg aa

32

<210> 58  
 <211> 34  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide  
 <400> 58  
 gggaattcat graatgsasc tgggtywtgc tctt. 34  
 <210> 59  
 <211> 33  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic oligonucleotide  
 <400> 59  
 actagtcgac atgaagwtgt ggbtraactg grt 33  
 <210> 60  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic oligonucleotide  
 <400> 60  
 cccaagctta ctggatggtg ggaagatgga 30  
 <210> 61  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic oligonucleotide  
 <400> 61  
 actagtcgac atggatttwc argtgcagat twtcagctt 39  
 <210> 62  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic oligonucleotide  
 <400> 62  
 ggaagcttcc accatggatt tcggactggc cc 32  
 <210> 63  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic oligonucleotide  
 <400> 63  
 ggactagtgg tttggacgag cctgttg 27

<210> 64  
 <211> 396  
 <212> DNA  
 <213> Unknown

<220>  
 <223> Mouse

<400> 64  
 ttttatttcc agcttggtcc cccctccgaa cgtgtacggc tgatgtgtac cttgtaagca 60  
 gtaatacatt cccaagtcct caggctttat tgtgctgac ttgagtgtga aatctgtccc 120  
 tgaaccactg ccactgaacc tgtctggcac ccagaaaaat ctgttggaat tcccatagat 180  
 gaggagctgt ggagactggc caggcttgtg caggtagcaa gacaaatagg tgttcccata 240  
 actctttgca agactctgac tagacctgca agagatagaa acttgatctc caaagctgac 300  
 aggcagggag agtggagttt gagtccaccac aacatcacct ccggaaacag gaatccagaa 360  
 caacagaagc accaacagcc taacaggcaa cttcat 396

<210> 65  
 <211> 336  
 <212> DNA  
 <213> Homo sapiens

<400> 65  
 tttgatttcc accttggtcc cttggccgaa cgtctgagga gttggtagag cttgcatgca 60  
 gtaataaacc ccaacatcct cagcctccac tctgctgatt ttctgtgtaa aatctgtgcc 120  
 tgatccactg ccactgaacc tgtcagggac cccggaggcc cgattagaac ccaaatagat 180  
 caggagctgt ggagactgcc ctggcttctg caggtagcaa tccaaatagt ttgatccatt 240  
 actatggagg aggtctgac tagacctgca ggagatggag gccggctctc caggggtgac 300  
 gggcagggag agtggagact gagtcatcac aatatc 336

<210> 66  
 <211> 420  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Mouse Act-1 antibody heavy chain variable region  
 with a signal peptide sequence-antisense

<400> 66  
 tgaggagacg gtgactgagg tgccttgacc ccagtagtca atagcatagt cccatccgtc 60  
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 catgtaggct gtgctggagg aaatgtctac agtcaatgtg gccttgccct tgaatttttg 180  
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